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1944

THE PAN-PACIFIC ENTOMOLOGIST

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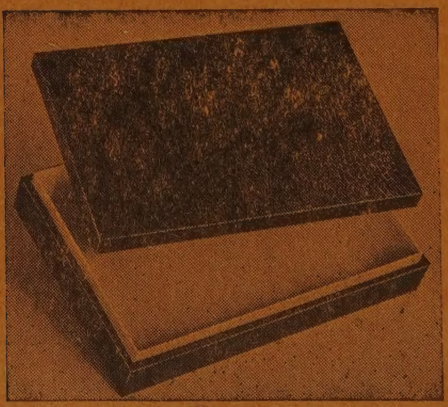

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NOTES ON THE NORTH AMERICAN SPECIES OF THE ZODION FULVIFRONS GROUP

(Diptera, Conopidae)

BY SIDNEY CAMRAS
Chicago, Illinois

In a previous paper (Ent. News, 54:187-191, 1943) the Oblique-fasciatum Group species has been covered and the sources of material acknowledged. As a result of the present study of the large series of specimens that has been aggregated, a number of species previously recognized appear to be synonyms. Some of these may prove to be separable in the future, and the necessity of depending on descriptions, since most of the types have not been seen, increases this possibility; but I believe that the present contribution will aid considerably in a better understanding of this difficult group. While the majority of specimens fall into definable species, individual variation frequently overlaps two species so that an artificial line of division must be established. This refers to species occurring in the same region as well as to intermediates between geographical races.

ZODION FULVIFRONS SAY

Zodion fulvifrons Say, 1823, Jour. Acad. Nat. Sci. Philadelphia, 3:83; Compl. Writ., 2:74 (Maryland).

Zodion abdominalis Say, 1823, Jour. Acad. Nat. Sci. Philadelphia, 3:84; Compl. Writ., 2:74 (near Rocky Mountains).

Myopa rubrifrons Desvoidy, 1830, Mem. Sav. étr. Acad. Sci. Paris, 2:247 (Philadelphia).

Zodion flavipennne Bigot, 1887, Ann. Soc. Ent. France (6)7:204 (Mexico).

Zodion lativentre Graenicher, 1910, Canad. Ent. 42:26 (Wisconsin: Yellow R., Burnett Cr.).

Zodion sayi Banks, 1916, Ann. Ent. Soc. Amer. 9:194 (Virginia: Falls Church).

Zodion obscurum Banks, 1916, Ann. Ent. Soc. Amer. 9:194 (California: Bear Valley, San Bernardino County)

? *Zodion bilineata* Van Duzee, 1927, Proc. Calif. Acad. Sci., 16:586 (Oregon: Wallowa Mountains).

This species is characterized by the larger size: usually 6-8 mm.; the short, wide, thick female genital plate; and the reddish abdomen of the male. The female abdomen is usually dark, but may be reddish on the basal segments. The first posterior cell is practically always open.

There are two main forms of this species. One has the dorsum of the thorax covered with bluish pollen and with two dark lines; the other has more brownish pollen and five lines on the dorsum of the thorax (= *sayi*). Most individuals however are somewhat intermediate, and the intergradation is complete. With the decrease in thoracic lines and more bluish pollen, the abdomen is usually more reddish, and the proboscis tends to become longer. Such individuals are more common in the West. A further extreme are those examples with so much pollen that the dorsal thoracic lines are indistinct. *Obscurum* seems to be based on such specimens.

In the past, it has been considered that the abdomen of the male of this species may be reddish or entirely dark; but I have found no contra-indication to referring all specimens with entirely dark abdomens to *intermedium*, although there is complete intergradation between the two types. There is also complete intergradation between this and a smaller species for which the name *abitus* is used here. Formerly, *abdominale* was used for this smaller species, but the name clearly belongs to a species "rather more than one-fourth of an inch" in length. The specimen mentioned by Say under *abdominalis* as "less than half the above size" does of course belong to the smaller species. I have set the dividing line between the two species at 5½ mm., but the majority of individuals are well above or below this size.

I have examined the type of *lativentre* and find it to be a greasy specimen of the present species. *Bilineatum* based on an example with a very long third antennal joint, will, I believe, prove to be an aberrant individual.

Distribution: Southern Canada, United States, and Mexico. 363 specimens examined.

Zodion intermedium Banks

Zodion intermedium Banks, 1916, Ann. Ent. Soc. Amer. 9:193 (Pennsylvania: Pocono Lake).

Zodion occidentale Banks, 1916, Ann. Ent. Soc. Amer. 9:194 (Oregon: Montaville).

Zodion reclusum Banks, 1916, Ann. Ent. Soc. Amer. 9:194 (California: Redlands).
Zodion basalis Van Duzee, 1927, Proc. Calif. Acad. Sci., 16:586 (Idaho: Moscow Mountains).

This species differs from *fulvifrons* by the long, narrow, thin female genital plate, and the entirely dark abdomen of the male.

As in *fulvifrons* there is similar variation in the thoracic lines and length of the prosboscis. *Basale* is based on indistinct thoracic lines, and *reclusum* on a long proboscis. There is a certain amount of variation in the size and shape of the genital plate, and intermediates bridge *intermedium* with *occidentale*. The relative length of the genital plate is frequently deceptive, and when the abdomen is extended may resemble that of *perlongum* which is proportionately longer and narrower. The border of dark striations is narrow in *intermedium* and *perlongum*, but very wide in *fulvifrons*.

Distribution: Southern Canada and United States. 162 specimens examined.

Zodion perlongum Coquillett

Zodion perlongum Coquillett, 1902, Canad. Ent., 34:199 (New Mexico: Rio Ruidosa).

This species is characterized by its large size: 7-9 mm.; very long, narrow, thin female genital plate; and the long, narrow abdomen due to the third and fourth abdominal segments which are longer than wide.

This species is known with certainty only in the female sex. The males are probably large individuals with reddish abdomens that cannot be distinguished from *fulvifrons*.

Distribution: United States and Northern Mexico. 22 specimens examined.

Zodion abitus Adams

Zodion abitus Adams, 1903, Kans. Univ. Sci. Bull., 2:33 (Kansas).
Zodion bicolor Adams, 1903, Kans. Univ. Sci. Bull., 2:35 (Kansas Douglas County).

This species is characterized by its small size: usually 4½-5 mm., reddish abdomen of the male, and usually closed first posterior cell.

The abdomen of the male is usually entirely reddish except for the first segment, with yellow pollen on the sides and distal

segments. Some specimens have dark markings representing intergradation with the entirely dark male abdomen of *cinereiventre*. Such individuals and those with an open first posterior cell are more common in the Western portion of the range of the species. The first posterior cell varies from narrowly open to petiolate as long as the anterior cross-vein. The palpi are short, not clavate, and about as long as the width of the proboscis.

The use of the name *abitus* instead of *abdominale* is explained under *fulvifrons*. *Abitus* is based on the female, and *bicolor* on the male.

Distribution: Southeastern Canada and Eastern United States, west to Colorado (Boulder, Buena Vista, Ridgway). 73 specimens examined.

Zodion cinereiventre Van Duzee

Zodion cinereiventris Van Duzee, 1927, Proc. Calif. Acad. Sci., 16:585 (California: Huntington Lake, Fresno County).

This species is characterized by its small size: 4½-5 mm., the dark abdomen of the male, and the open first posterior cell.

This species is similar to *abitus* in the female and differs only in that the first posterior cell is always open. It is probable that this cell may be closed, showing variation similar to *abitus*, but in the East such individuals are referable to *abitus* and on the West Coast to *triste*. Females with rather wide first posterior cells have been seen from Michigan and New York, but may be considered extremes of *abitus*. Typical dark abdomened males have been examined from as far east as Illinois.

Distribution: Western United States east definitely to Illinois. 34 specimens examined.

Zodion triste Bigot

Zodion triste Bigot, 1887, Ann. Soc. Ent. France (6)7:203 (California).

This name is used here for a species in which the female genital plate is long, moderately wide, and thin in anteroposterior dimension; and yellowish narrowly edged with the dark striations. The first posterior cell is closed or narrowly open. The length is 4½-5 mm., and it is otherwise similar to *cinereventre*. The males in which the first posterior cell is open cannot be distinguished from *cinereiventre* and would be referred here only when associated with the female.

Distribution: California (San Diego). 1♀, 1♂ (1st post. cell closed), 1♂ (1st post. cell open).

ZODION NIGRIFRONS KRÖBER

Zodion nigrifrons Kröber, 1915, Arch. Nat., 81 A., h.4, 97 (California).

Zodion hirtipes Van Duzee, 1927, Proc. Calif. Acad. Sci., 16:587 (California: Melrose, Alameda County).

This species differs from the other members of the genus by the characteristic fourth vein, the last segment of which ends about halfway toward the wing margin. This character has proved constant in the twelve specimens examined and was mentioned in the original descriptions of both *nigrifrons* and *hirtipes*. The species in general has long hairs and is very dark, the front and antennae being usually almost entirely dark, and the thorax so dark that the darker dorsal lines may be quite indistinct. The palpi are short, about 1½x width of the proboscis, and not clavate. Length, 4½-5 mm.

Distribution: California (Melrose, Alameda County; Berkeley; Fish Ranch, Berkeley Hills). 12 specimens examined.

ZODION AMERICANUM WIEDEMANN

Zodion americana Wiedemann, 1830, Auss. Zw. Ins., 2:242 (Montevideo).

Zodion nanellum Loew, 1869, Berl. Ent. Zeitschr., Cent. VIII, 75 (District of Columbia).

Zodion pygmaeum Williston, 1885, Trans. Conn. Acad., 6:381 (California).

? *Zodion occidensis* Walker, 1849, List. Dipt. Brit. Mus., 3;676 (Ohio).

This species is characterized by its small size: 3-5 mm., constantly open first posterior cell, and relatively sharply defined black markings of the thorax and abdomen.

This species differs from *cinereiventre* and the other small forms in being covered with finer pollen which is bluish or greenish; and in having the dark markings usually more extensive, more opaque, and more sharply defined.

The variation in dark markings is very great and completely bridges the difference between *nanellum* and *pygmeum*. Three males from New Mexico (Highrolls, Alamogordo) completely lack the thoracic lines and spots, and have less black on the abdomen than usual. These may repreesnt another species. Nor-

mally patterned specimens heve been examined from Highrolls.

Kröber has compared the type of *americanum* with *nanellum* and considers them the same species. I have seen examples of this species from a number of localities in South and Central America.

Distribution: Southern Canada, United States, Central America, and South America. 226 specimens examined.

Zodion palpale Robertson

Zodion palpalis Robertson, 1901, Canad. Ent., 33:284 (Illinois: Carlinville).

This species is characterized by the black, long, clavate palpi; which are 2½-3x the width of the proboscis at the level of the palpi. The first posterior cell usually has a long petiole, but it may be narrowly open. The labellae of the proboscis are quite long, about one-fourth the total length of the proboscis. They are much shorter in the previous species but apparently are long also in *lovetti* and *parvum*. When the labellae are together it may be difficult to decide their length. The abdomen of the male has the second and third segments yellow, more reddish on the distal part of the third; and is relatively long and slender. The legs are rather slender and entirely dark. Length, 5 mm.; 1 ♂ 4 mm.

Distribution: Illinois (Carlinville) and North Carolina (Raleigh). 19 specimens examined, including the type.

Zodion scapulare Adams

Zodion scapularis Adams, 1903, Kans. Univ. Sci. Bull., 2:34 (Arizona).

This species has not been seen by the writer, but has been incorporated into the key. It represents a species between *palpale* and *parvum*, having the abdomen of the former and the palpi of the latter. Very few specimens are known of this group of species and additional material may show that some of these represent individual variation.

Distribution: Arizona.

Zodion parvum Adams

Zodion parvis (*parvus* in key) Adams, 1903, Kans. Univ. Sci. Bull., 2:34 (Arizona).

This species is characterized by its small size: 3½ mm.; long petiole of the first posterior cell: 3x anterior cross-vein; short,

pale, non-clavate palpi, 1x width of proboscis; and dark abdomen of the male. The legs are slender and dark, and the labellae about one-third the length of the entire proboscis.

Distribution: Arizona and Colorado (no locality). One specimen examined.

Zodion lovetti Van Duzee

Zodion lovetti Van Duzee, 1934, Ann. Ent. Soc. Amer., 27:323 (Colorado: Fort Collins).

This species is characterized by its long (2x width of proboscis), but not clavate palpi; entirely dark abdomen of the male; and small size: 4 mm. The first posterior cell is closed in the wing margin to petiolate as long as anterior cross-vein. The legs are slender and entirely dark.

This species represents another link between *palpale* and *parvum*, having the long, though not clavate palpi of the former, and the dark abdomen of the latter.

Distribution: Colorado (Fort Collins, Tennessee Pass). One specimen examined.

The following species, each based on a single female, are not known to the author, and have not been included in the key:

Zodion albifacies Van Duzee, 1927, Proc. Calif. Acad. Sci., 16:588 (Arizona: Baboquivari Mountains).

Zodion angusticornis Van Duzee, 1927, Proc. Calif. Acad. Sci., 16:589 (California: Los Banos).

Zodion bimacula Curran, 1933, Amer. Mus. Nov., 673:7 (Ontario: Timagami).

Key to the North American Species of Zodion

1. Thorax marked with black spots ..... *pictulum*
– Thorax marked with stripes or unmarked 2
2. Thorax dark with two relatively wide light stripes 3
– Thorax light with relatively narrow dark stripes or unmarked 5
3. Abdomen with golden yellow pollen on distal segments ..... *albonotatum*
– Abdomen with oblique white or bluish pollinose markings 4
4. Abdomen dark with bluish pollinose markings ..... *cyanescens*
– Abdomen mostly rufous with white pollinose markings ..... *obliquefasciatum*
5. Abdomen with golden pollen on distal segments; never with anterior submedian thoracic lines ..... *albonotatum*
– Abdominal pollen if yellowish, never golden 6

6. Abdomen mostly rufous with oblique white pollinose marks; anterior submedian thoracic lines absent.....*obliquefasciatum*
– Abdomen usually dark, pollinose pattern if oblique not distinctly so; frequently with anterior submedian thoracic lines..7
7. Over 5½ mm. long from base of antennae to tip of abdomen..8
– 5½ mm. long or less.....12
8. Females.....9
– Males.....11
9. Genital plate short, wide, and thick.....*fulvifrons*
– Genital plate long, narrow and thin.....10
10. Abdominal segments 3 and 4 shorter than wide....*intermedium*
— Abdominal segments 3 and 4 longer than wide.....*perlongum*
11. Abdomen with rufous.....*fulvifrons*
(Some of the larger and more rufous individuals are probably males of *perlongum.*)
— Abdomen with no rufous.....*intermedium*
12. Last segment of fourth vein ends about half way toward the wing margin .....*nigrifrons*
— Last segment of fourth vein extends to wing margin.....13
13. Thoracic and abdominal markings relatively sharply defined; first posterior cell always open.....*americanum*
— Thoracic and abdominal markings relatively less sharply defined.....14
14. Palpi long, clavate; 1st posterior cell usually petiolate..*palpale*
— Palpi usually short, never clavate.....15
15. Palpi 2x width of proboscis, first posterior cell closed or petiolate.....*lovetti*
— Palpi 1-1½ times width of proboscis.....16
16. First posterior cell petiolate more than 2x anterior cross-vein 17
— First posterior cell petiolate less than 2x anterior cross-vein, or open 18
17. Size larger, about 5 mm.; legs more reddish; male abdomen with yellow on 2nd and 3rd segments.....*scapulare*
— Size about 3½ mm.; legs dark; male abdomen dark....*parvum*
18. Females.....19
— Males.....21
19. Genital plate long and thin.....*triste*
— Genital plate short and thick.....20
20. First posterior cell open.....*cinereiventre*
— First posterior cell closed.....*abitus*
21. Abdomen with red.....*abitus*
— Abdomen with no reddish.....22
22. First posterior cell closed.....*triste*
— First posterior cell open.....*cinereiventre, triste*

FOUR NEW SPECIES OF CLOANTHANUS AND TUMEUS FROM MEXICO AND BRAZIL

(Homoptera, Cicadellidae)

BY DWIGHT M. DE LONG
Department Zoology and Entomology, Ohio State University

Cloanthanus dilatus De Long, new species

Resembling *nitridus* in general form and appearance but with distinct genitalia. Length, 4-4.5 mm.

Vertex produced and bluntly angled, one-fourth longer at middle than basal width between the eyes.

Color: Vertex black with a short longitudinal white dash on apex and a white dash on margin either side half way between apex and eye. A short indistinct dash is on base either side of middle. Pronotum heavily mottled with dark brown and with five pale longitudinal lines. Scutellum with basal angles dark brown, the central third paler, the apical angle white margined. Elytra pale, veins dark brown and with dark brown coloration and pigment lines rather uniformly distributed. Many white areolar spots in most of cells of fore wing. Face yellow, dusky above.

Genitalia: Female last ventral segment gradually, broadly, produced, slightly notched at middle. Male plates triangular, about as long as combined basal width. Style rather short, deeply excavated at apex to form a finger-like process on inner apical margin. Aedeagus curved so as to form a long slender basal portion which is slender and curves dorsally, and apical portion which curves dorsally and tapers to apex which is broadened by a triangular process on each side at apex.

Holotype male and *allotype* female collected at COSOMATEPEC, VER. MEXICO, November 30, 1924 (M. B. 103). *Paratype* male from POPAIAOPAM, VER. MEXICO, December 12, 1937 (M. B. 397), all collected by Dr. Dampf.

Cloanthanus hambletoni De Long, new species

Resembling *lineafrons* in form and general appearance but with distinct coloration and male genitalia. Length: male, 5 mm.

Vertex strongly produced and bluntly angled more than twice as long as basal width between the eyes.

Color: Vertex pronotum and scutellum tawny, the disc of pronotum a little darker. Vertex with a pale longitudinal median line on apical third and one next either eye. At the end of the apical median line a longitudinal line arises either side of middle and

extends to base of vertex. Pronotum with five pale longitudinal lines. Scutellum with a pale spot in each basal angle and a longitudinal line either side equidistant from basal angle and each other. Elytra pale, veins dark brown and with brown pigment in most of cells. Apical margin broadly brown and with numerous brown markings resembling veinlets. Face dark brown, margin pale and with narrow pale arcs.

Genitalia: Male plates short, strongly convexly rounded to near apex where they are produced to form bluntly pointed apices. Style deeply, rather broadly concavely excavated at apex to form a long, outwardly curved finger-like process on inner apical margin. Aedeagus composed of a dorsal L-shaped process and a pair of long ventral processes. The ventral processes are gradually widened on apical half to form broad truncate apices with a long pointed spur on dorsal apical angle and a short, blunter spur on ventral apical angle.

Holotype male, collected at CAMPINAS SAO PAULO, BRAZIL, April 12, 1936, by E. J. Hambleton.

Cloanthanus fasciatus De Long, new species

A robust, blunt headed species with banded elytra, and distinct male genitalia, most closely related to *plummeri*. Length, male, 5.5 mm.

Vertex short, blunt, scarcely angled a little shorter at middle than basal width between the eyes. Vertex slightly depressed on median line.

Color: White irrorate with brown. Vertex and pronotum rather evenly irrorate with brown except for depressed portion just posterior to apex of vertex which is brown. Scutellum irrorate with brown, basal angles dark brown. Face heavily irrorate with brown. Margin above appearing to have four black spots on a white band. A short white transverse band just beneath margin. Elytra white with irrorations forming two rather definite broad bands. The anterior band extends across basal half of clavus. The posterior band extends from apex of clavus to tip of elytra.

Genitalia: Male plates short, broad at base, convexly rounded to blunt apices. Style short and broad. The finger process on the inner margin rather heavy and more than half as long as the basal portion of style, sloping caudally and outwardly. Aedeagus with a short, thick curved dorsal portion which is bifid on basal half. This is connected by a slender process to the basal portion which is rather broad in ventral view and has a pair of rather short thick divergent spines at apex.

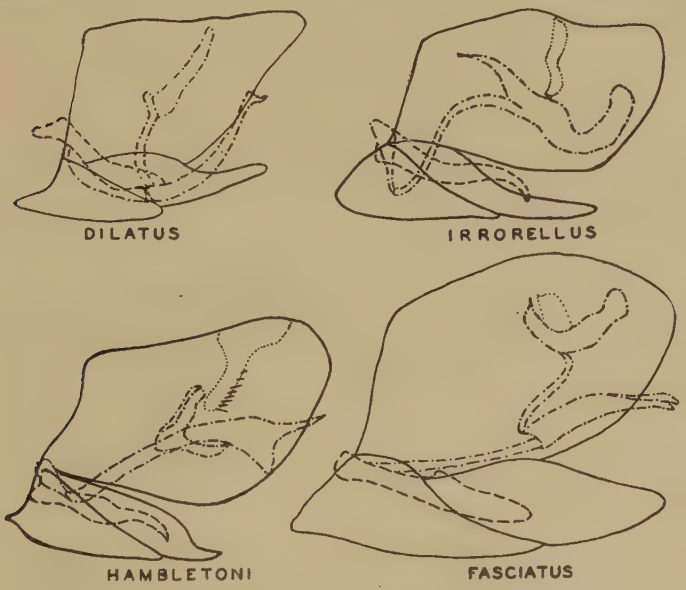
Holotype male collected at PUEBLA, PUEBLA, MEXICO, elevation 8,500 feet, October 18, 1941, by E. E. Good, J. S. Caldwell, C. C. Plummer and the author. This blunt headed species is large, robust and distinct from any others of this genus.

Tumeus irrorellus De Long, new species

Resembling *divisus* in general form but with distinct coloration and male genitalia. Length, male 6 mm.

Vertex produced with margin convexly rounded at apex to a blunt tip, twice as long at middle as basal width between the eyes.

Color: Vertex, pronotum and scutellum brown with pale irrorations. The margin of the vertex at apex is dark brown and the disc of the pronotum is darker. There are traces of the five pale longitudinal lines on the pronotum. Elytra pale with dark brown irrorations and ramose pigment lines, a few white areolar spots on all portions of the fore wing. Face dark brown with pale irrorations.



EXPLANATION OF FIGURES

Lateral view of male genitalia of species as labelled.

Genitalia: Male plates rather short, triangular, combined width at base about one-third greater than length. Valve broad and rounded. Style deeply narrowly notched on outer margin near apex to form a narrow finger-like process on apical third. Aedeagus in lateral view rather broad, with a basal spur-like process extending anteriorly. The apical half is bent sharply dorsally and is inflated, the apex is blunt and rounded.

Holotype male collected at CAMPINAS, SAO PAULO, BRAZIL, April 12, 1936, by E. J. Hambleton.

NEW SPECIES AND RECORDS IN MEGACHILE
(Hymenoptera, Megachilidae)

BY THEODORE B. MITCHELL[1]
University of North Carolina, Raleigh

The material described and recorded here was received in large part from C. D. Michener, P. H. Timberlake and G. E. Bohart in California and R. H. Beamer in Kansas, with various scattered records from other sources.

Subgenus Argyropile Mitchell

Megachile (Argyropile) parallela Smith

Megachile parallela Smith, 1853, Cat. Hymen. Brit. Mus., 2:191.
Megachile verbesinae Cockerell, 1908, Ann. Mag. Nat. Hist. (8)1:264. *New synonomy.*

In the revision of Nearctic Megachile[2] the suggestion was made that *verbesinae* should be considered a synonym of *parallela*, but the observation was unsupported by personal examination of the types. The specimen here recorded, which is a typical *parallela* in all respects, has been compared with the type of *verbesinae* by Timberlake and found to be identical.

Arizona: 1♀ Sonoita, August 9, 1940 (Timberlake, on *Verbesina*).

Megachile (Argyropile) nebraskana Mitchell

Colorado: 1♀, White Rocks, near Boulder, June 29, 1939 (Timberlake, on *Monarda*).

Megachile (Argyropile) subparallela Mitchell, new species

Female. Size: Length, 8.3 mm.; breadth of abdomen 3 mm.; anterior wing, 6 mm.

Structure: Face slightly broader above than distance from clypeal margin to anterior ocellus; eyes very slightly convergent below; clypeal margin with a small acute triangular projection separating a pair of small emarginations; mandibles 4-dentate,

[1] Research Contribution No. 20, published with the aid of the State College Research Fund, Department of Zoology, North Carolina State College of Agriculture and Engineering of the University of North Carolina.
[2] 1937, Trans. Amer. Ent. Soc., 63:57.

the teeth acute, a conspicuous cutting edge between the third and fourth, a mere vestige of one between the second and third; basal segment of flagellum very slightly longer than pedicel, the following segments only slightly longer than broad; lateral ocelli very slightly nearer to edge of vertex than to eyes; vertex nearly flat and hind margin only slightly incurved; cheeks below subequal to eyes in width, somewhat narrower above; metatarsi somewhat shorter and narrower than their tibiae, but relatively robust; abdomen cordate in form, the sixth tergum straight in profile, with suberect hair visible toward base; apical margin of the sixth sternum thickened and slightly reflexed.

Puncturation: Fine and close on dorsum of thorax, more coarse on pleura, vertex, clypeus and cheeks below, fine and close on cheeks above and face above antennae; minute and densely crowded on basal segments of abdomen, becoming relatively coarse and sparse on fifth tergum, fine and crowded on the sixth.

Color: Black; wings subhyaline, nervures ferruginous to fuscous; tegulae yellowish-ferruginous along outer margin, darker within; spurs yellowish-ferruginous.

Pubescence: White and rather dense on face and clypeus, cheeks below, pleura, propodeum and base of abdomen; vertex with some inconspicuous darker hairs interspersed with pale hairs, mesonotum, scutellum, and discs of segments 2-5 with short inconspicuous dark pubescence, the sixth sparsely covered with subappressed yellowish hairs; segments 2-5 with narrow entire yellowish apical fasciae; scope creamy-white, that on sixth sternum very sparse and including a few dark hairs.

Male: Size: Length, 9.7 mm.; breadth of abdomen, 3.4 mm.; anterior wing, 7 mm.

Structure: Face about equal in breadth to distance from clypeal margin to median ocellus; eyes convergent below; clypeal margin beneath beard smooth and shining, slightly incurved; mandibles 3-dentate, the inner tooth robust and triangular, the basal inferior projection slender; basal segment of flagellum longer than pedicel, the following segments twice as long as broad, lateral ocelli subequally distant from eyes and edge of vertex; vertex nearly flat, hind margin nearly straight; cheeks subequal to eyes in width, not excavated below; front coxal spines short, the tips triangularly acute; front tarsi long, slender and unmodified; front tibiae and femora unmodified; mid and hind legs slender, the metatarsi narrow and quite short, the mid tarsal segments not at all produced apically; segments of abdomen quite deeply grooved basally, the apical margins deeply and abruptly depressed except on the basal segments medially, the disc of the fifth tergum carinate apically and slightly overhanging the depressed apical margin; carina of sixth tergum semi-circular in form, with a deep rounded median emargination, apical margin of the tergum with robust subtruncate carinate median teeth which are much nearer the small triangular lateral angles than to each other; seventh tergum obscure, rounded

apically; fourth sternum exposed; presternite of fifth sternum almost linear medially, with a patch of pubescence apically on each side, the medasternite beset with setae, the tips of which are broadly dilated and flexed, a fringe of simple setae around basal margin, the poststernal strip straight and simple; medasternal areas of sixth sternum contiguous medially at base, closely covered with short robust setae with strongly dilated and flexed tips, the poststernal lobe very broadly semi-circular in outline; cardo of genital armature quite narrow, stipites entirely bare, slightly dilated and flattened apically and slightly exceeded in length by the simple sagittae, volsellae quite robust, triangularly pointed apically.

Puncturation: Fine and rather sparse on dorsum of thorax, the surface dull and granular; somewhat more coarse and close on pleura and propodeum, but obscured by dense pubescence; moderately coarse and rather sparse on vertex medially, becoming fine and close on cheeks below; rather fine and close on basal segments of abdomen, becoming more coarse and more widely separated to the fifth tergum, close and substriate on the sixth above carina.

Color: Black; antennae beneath more brownish; apices of front and mid tibiae ferruginous; tegulae yellowish-ferruginous on outer portion; wings subhyaline, nervures piceous to ferruginous; spurs yellowish.

Pubescence: Pale throughout; long and dense on face, clypeus, cheeks, pleura, propodeum, and base of abdomen, front tarsi with a rather thin white fringe; segments 2-4 of abdomen with entire white apical fasciae, the fifth not fasciate but with some basal white tomentum, the sixth with dense white tomentum covering most of disc above.

Holotype female DOUGLAS, ARIZONA, August 16, 1936 (W. W. Jones), *allotype* male, topotypical (W. W. Jones), [both Timberlake].

The male of *subparallela* differs from that of *parallela* in the following respects: The definitely 3-dentate mandibles (either obscurely or distinctly 4-dentate in *parallela*); the absence of a median tubercule on the clypeal margin; the median apical teeth of the sixth tergum are truncate and carinate (usually slender and acute in *parallela* but subject to considerable variation); the seventh tergum lacking the slight median indentation found in *parallela*; and the lack of a distinct apical fascia on the fifth tergum. The range of variation in *parallela* is considerable, but this form seems to lie outside that range.

The female of *subparallela* runs to *sabinensis* in the key recently published.[3] However, *sabinensis* is much larger and the

[3] 1943, Pan-Pac. Ent., 19:12.

clypeal margin is relatively straight, the median tubercle being minute and not delimited by the emarginations found in *subparallela*. Moreover, in *sabinensis* the scopa on the sixth sternum is entirely black, this being almost entirely pale in *subparallela*, and the sixth tergum bears conspicuous white tomentum medially, with darker erect basal hairs and appressed fuscous tomentum apically. In *subparallela* the disc of this segment is quite uniformly covered with rather sparse suberect yellowish pubescence, with neither definitely black nor white hairs in evidence.

Subgenus Delomegachile Viereck

Megachile (Delomegachile) frigida Smith

Before her death, Dr. Grace Sandhouse called my attention to the fact that I was in error in my use of the name *vidua* instead of *frigida* for this species. Smith proposed both names, *vidua* for the female on p. 192 and *frigida* for the male on p. 193 (Cat. Hym. Brit. Mus. 1, 1853). As the name *vidua* has page precedence, it was thought proper to use. However, Cresson in his Synopsis of Hymenoptera, p. 303, 1887, made *vidua* a synonym of *frigida*, in spite of the page precedence of *vidua*, and according to article 28 of the International Rules of Zoological Nomenclature, "If the names are of the same date, that selected by the first reviser shall stand."

Subgenus Xeromegachile Mitchell

Records of four species, namely *deflexa*, *manifesta*, *nevadensis*, and *wheeleri*, are omitted in the following list, since they add little to the present knowledge of their distribution.

Megachile (Xeromegachile) alata Mitchell

California: 1 ♂, Mt. San Jacinto, Riverside County, May 28, 1939. 1 ♂, Argus Mts., Inyo County, June 4, 1939. 1 ♂, N. Inyo Mts., Inyo County, June 7, 1939 (all R. M. Bohart). 2 ♂, Taquitz Canyon, Riverside County, April 16, 1938 (R. M. and G. E. Bohart). 2 ♂, Independence, Inyo County, June 1, 1937 (W. C. Reeves). 1 ♂ Palm Canyon, April 9, 1938 (E. P. Van Duzee).

Megachile (Xeromegachile) bradleyi Mitchell

Utah: 1 ♀, Orr's Ranch, September 11, 1935 (G. F. Knowlton).

MEGACHILE (XEROMEGACHILE) BRIMLEYI MITCHELL

FLORIDA: 1♂, Cedar Keys, August 10, 1939 (R. H. Beamer). NORTH CAROLINA: 3♂, 10 miles south of Lillington, July 7, 1938 (Mitchell and Hill). 1♀, Carolina Beach, July 25, 1941 (T. B. Mitchell).

MEGACHILE (XEROMEGACHILE) CASADAE COCKERELL

COLORADO: 1♀, 8 miles south of Grand Mesa, July 12, 1938, scrub oak zone (U. Lanham). 1♀, Mishawauka, July 11, 1937 (H. T. Peters). OKLAHOMA: 1♀, Hinton, June 5, 1939 (Kaiser-Nailon).

MEGACHILE (XEROMEGACHILE) COLORADENSIS MITCHELL

COLORADO: 1♀, Buffalo, August (E. S. Tucker).

MEGACHILE (XEROMEGACHILE) DAKOTENSIS MITCHELL

IOWA: 12♀, County 3, July 10-14, 1936 (Anderson, Barry, Jacques and Millspaugh). TEXAS: 1♀, Romney, June 30, 1936 (R. H. Beamer).

MEGACHILE (XEROMEGACHILE) FUCATA MITCHELL

CALIFORNIA: 1♂, Essex, May 29, 1937 (M. A. Cazier). 3♂, Inyo Mts., Inyo County, May 23, 1937 (W. C. Reeves). 1♂, Mazourka Canyon, Inyo Mts., 6,000 feet, June 1, 1937 (Michener, on *Encelia farinosa*). 1♂, Argus Mts., Inyo County, May 22, 1937. 1♂, Inyo Mts., June 1, 1937 (E. C. Van Dyke).

MEGACHILE (XEROMEGACHILE) HISTRATA MITCHELL

ARIZONA: 1♀, Tucson, April 24, 1937 (W. Benedict). CALIFORNIA: 1♀, Mohave Desert, 1932. 1♀, N. Inyo Mts., Inyo County, June 7, 1939 (R. M. Bohart).

The specimen from N. Inyo Mts. bears the same data as a male of *Xeromegachile alata* (see page 135) suggesting the probability that the two are the same. If this proves to be the fact, *histrata* will become a synonym of *alata* since the latter has page precedence.[4]

[4] 1934, Trans. Amer. Ent. Soc., 59:324, 334.

MEGACHILE (XEROMEGACHILE) HOOKERI COCKERELL

COLORADO: 1♀, (no data) (T. Pergande). UTAH: 3♀, Desert, September 9, 1938 (L. L. Hanson). 3♀, Valley Mts., 7,000 feet, September.

MEGACHILE (XEROMEGACHILE) IMPARTITA MITCHELL

CALIFORNIA: 1♀, Westgard Pass, Inyo County, May 27, 1937 (R. M. and G. E. Bohart). 1♀, Lone Pine, Inyo County, May 23, 1937. 1♀, Inyo Mts., June 1, 1937 (both E. C. Van Dyke).

MEGACHILE (XEROMEGACHILE) INTEGRA CRESSON

FLORIDA: 5♂, 3♀, Suwannee Springs, August 2 and 3, 1939 (Beamer, Hardy and Wegenek). 1♀, Suwannee Springs, July 29, 1930 (P. W. Oman). 2♂, Branford, July 31, 1930. 1♂, Lacoochee, August 18, 1930 (both J. Nottingham). 1♀, Sanford, August 8, 1939 (R. H. Beamer).

MEGACHILE (XEROMEGACHILE) LEGALIS CRESSON

Megachile legalis Cresson, 1879, Trans. Amer. Ent. Soc., 7:209. *Megachile* (*Xeromegachile*) *couleeana* Mitchell, 1938, Pan-Pac. Ent., 14:171. *New Synonomy.*

The true identity of the female described under the name *couleeana* has become evident by the collection by Timberlake of a series of 2 males and 6 females at the same time and on the same flower, in the absence of any other closely related species. Only 3 specimens of this series have been examined personally, the record of which, together with others, follows.

ARIZONA: 1♂, Flagstaff, June 11, 1909 (F. C. Pratt, on *Iris*). CALIFORNIA: 1♂, Independence, Inyo County, June 11, 1937 (W. C. Reeves) NEVADA: 1♂, 2♀, Kyle Canyon, Charleston Mts., 5,000 feet, June 3 and 4, 1941 (Timberlake, on *Cirsium*). OREGON: 1♀, Culver, July 2, 1935 (R. H. Beamer).

MEGACHILE (XEROMEGACHILE?) MAURATA MITCHELL

For a note concerning the status of this species, see *M.* (*Derotropis*) *subanograe*, page 139.

CALIFORNIA: 3♂, Panamint Mts., 5 miles north of Wildrose Canyon, 5,000 feet, Inyo County, May 27, 1937 (Michener, on *Sphaeralcea ambigua*). 1♂, Panamint Mts., May 30, 1937 (E. C. Van Dyke).

MEGACHILE (XEROMEGACHILE) MOJAVENSIS MITCHELL

CALIFORNIA: 1♀, Lone Pine, Inyo County, May 19, 1937 (W. C. Reeves). 1♀, Lone Pine, May 23, 1937 (E. C. Van Dyke).

MEGACHILE (XEROMEGACHILE) MUCOROSA COCKERELL

COLORADO: 2♂, (Snow). KANSAS: 1♂, Clark County, (F. H. Snow). TEXAS: 1♂, Romero, June 22, 1940 (E. E. Kenaga).

MEGACHILE (XEROMEGACHILE) OSLARI MITCHELL

COLORADO: 2♀, Durango, 6,300 feet, June 3 and 11, 1936 (B. Rotger).

MEGACHILE (XEROMEGACHILE) PALMENSIS MITCHELL

CALIFORNIA: 2♂, Taquitz Canyon, Riverside County, April 16, 1938. 5♂, 4♀, Palm Canyon, Riverside County, April 15, 1938, on *Sphaeralcea ambigua* and *Encelia farinosa* (both R. M. and G. E. Bohart).

MEGACHILE (XEROMEGACHILE) SOLEDADENSIS COCKERELL

ARIZONA: 1♂, Picacho Pass, August 7, 1940. 1♂, Pepper Sauce Canyon, Santa Catalina Mts., August 16, 1940 (both E. S. Ross). 1♂, Sonoita, August 9, 1940 (Timberlake, on *Verbesina enceloides*). TEXAS: 1♂, El Paso, August 21, 1908 (F. C. Pratt).

MEGACHILE (XEROMEGACHILE) SUBNIGRA CRESSON

CALIFORNIA: 5♂, Leavitt Meadow, Walker River, Mono County, June 25, 1937 (E. C. Van Dyke). 1♂, Siskiyou County, June 2, 1911. 7♂, 3♀, W. Walker River, Mono County, 7,200 feet, June 25, 1937 (Michener, on *Aster* and *Senecio*). IDAHO: 1♀, Craters of Moon, June 20, 1938 (E. C. Van Dyke). NEVADA: 1♂, 25 miles northwest of Geriach, Washoe County, May 29, 1939 (Ting, Cazier, Downes and Aitken). WASHINGTON: 1♀, Cliffdell, July 7, 1935 (E. I. Beamer). WYOMING: 1♂, Grand Teton National Park, July, 1937 (R. M. and G. E. Bohart

MEGACHILE (XEROMEGACHILE) SUBNIGRA VAR. ANGELICA MITCHELL

CALIFORNIA: 1♂, Westgard Pass, Inyo County, June 3, 1937 (N. W. Frazier). 1♂, Westgard Pass, June 15, 1937. 2♂, Mazourka Canyon, Inyo Mts., 6,000 feet, June 1, 1937 (both Mich-

ener, on *Encelia farinosa*). 1♂, Feather River, Butte County, June 14, 1940 (Cazier and Aitken). 2♂, Westgard Pass Plateau, June 3, 1937. 6♂, Lone Pine, Inyo County, May 23-24, 1937 (both E. C. Van Dyke). 1♂, Mt. San Jacinto, Riverside County, May 28, 1939 (both R. M. Bohart). OREGON: 1♂, Quartz Creek, 20 miles east of Ely, Lake County, 5,500 feet, July 8, 1937. 1♂, Cherry Creek, west side Klamath Lake, 4,175 feet, June 26, 1937 (both Bolinger and Jewett). IDAHO: 1♀, (*blaisdelli*), Craters of Moon, June 20, 1938 (E. C. Van Dyke).

SUBGENUS DEROTROPIS MITCHELL

Four species of *Derotropis* are known in both sexes, *gravita* (♀ *astata*), *pascoensis* (♀ *gabrielensis*), *xerophila* and *astragali*. Four other species are known only in one sex, the male only of *alamosana* and the females only of *anograe*, *subanograe** and *laurita*. It now seems probable that *alamosana* is the male of *anograe*, judging from the range, these being the easternmost in distribution, and from the similarity of the two forms to the respective sexes of *gravita* and *pascoensis*. This relationship, however, remains to be demonstrated. Some evidence concerning the identity of the male of *subanograe* can now be presented, but that of *laurita* still has to be discovered.

MEGACHILE (DEROTROPIS) SUBANOGRAE MITCHELL

A series of five females of this species received from C. D. Michener was accompanied by three males of *M.* (*Xeromegachile*) *maurata* Mitchell, the two series bearing identical data as to locality, date and flower record. This suggests their common identity, and if proven correct, results in obscuring the distinctions between the males of *Xeromegachile* and *Derotropis*. They are quite similar in size and in general appearance, and to that degree the association seems a reasonable one.

An additional question concerns the range of variation of the females of this species. A number of specimens from Arizona, California, Nevada, and Texas have been received, all bearing strong resemblances to typical *subanograe*, but with enough differences to indicate the possibility, at least, that they represent different species. Were these accompanied by males, a more

* The specimen recorded on p. 174, Pan-Pacific Ent. 14, 1938, evidently is a female, not a male as indicated.

positive opinion in the matter would be warranted. Since the males are not known, two of these variants are described below, and the test of their validity is left to the future. Records of the more typical *subanograe* follow.

CALIFORNIA: 1♀, Panamint Mts., Inyo County, May 29, 1937 (N. W. Frazier). 5♀, 5 miles north of Wildrose Canyon, Panamint Mts., Inyo County, 5,000 feet, May 27, 1937 (C. D. Michener, on *Sphaeralcea ambigua*). UTAH: 2♀, 12 miles east of Jensen, June 23, 1939 (Timberlake, on *Sphaeralcea*). NEVADA: 1♀, Lee Canyon, Mt. Charleston, Clark County, May 24, 1940 (Reeves, Cazier and Ting).

Megachile (Derotropis) melanderi Mitchell, new species

Female. Size: Length, 9 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 7 mm.

Structure: Length and breadth of face equal; eyes nearly parallel; apical margin of clypeus nearly straight and entire; mid tooth of mandible about twice as distant from inner angle as from apex of mandible; second joint of labial palpus not greatly exceeding the first in length (ratio of about 10-7); second segment of flagellum subequal to pedicel, the first considerably longer, middle segments about as long as broad, apical one longer; lateral ocelli subequally distant from eyes and edge of vertex; vertex nearly flat, its posterior margin only slightly curved; cheeks subequal to eyes in width; mid and hind metatarsi nearly as broad as their tibiae and about four-fifths as long; sixth tergum straight in profile, with erect hairs evident.

Puncturation: Fine and close on middle of face, supraclypeal area, upper margin of clypeus, on either side of middle of vertex, on scutellum except in center and on upper portions of pleura; more coarse and irregular on clypeus medially, fading out toward the margin; shallow and obscure on cheeks, becoming sparse below; relatively sparse above ocelli; deep and distinctly separated on mesonotum, rather widely so in center, as also on scutellum; more coarse on pleura below; minute and obscure but quite close on abdomen basally, becoming increasingly sparse to the fifth tergum, more close, deep and coarse on the sixth.

Color: Black; flagellum more fuscous; tegulae ferruginous with fuscous blotches; wings subhyaline, somewhat clouded apically, nervures fuscous to blackish; front and middle tibial spurs yellowish, hind spurs more fuscous.

Pubescence: Entirely white on head, thorax, legs and segments 1 and 2 of abdomen; black and erect on discs of segments 3-5, the sixth with scattered erect black hairs and subappressed silvery tomentum; segments 1-5 with dense, entire and conspicuous white apical fasciae; scopa white, black on fifth and sixth sterna.

Holotype female: MARFA, TEXAS, April 28, 1942 (A. L. Melander) [Timberlake].

Megachile (Derotropis) yumensis Mitchell, new species

Female. Size: Length, 9.3 mm.; breadth of abdomen, 3.5 mm.; anterior wing, 6.5 mm.

Structure: Breadth of face about equal to distance from clypeal margin to median ocellus; eyes slightly convergent below; clypeal margin broadly impunctate, straight and simple; mandibles 3-dentate, distance from apex of inner tooth to that of middle tooth not quite twice that from the middle to the apical tooth, a prominent cutting edge between the second and inner teeth; second joint of labial palpus not greatly exceeding the first in length (ratio of about 11-8); basal segment of flagellum longer than pedicel or the second segment, the median segments only about as long as broad; lateral ocelli subequally distant from eyes and edge of vertex; vertex slightly rounded; its hind margin very slightly incurved; cheeks subequal to eyes in width; all the metatarsi slightly narrower and considerably shorter than their respective tibiae; abdomen cordate in form; sixth tergum straight in profile, with abundant erect hair visible.

Puncturation: Rather fine on head, irregular and rather deep on clypeus beneath the dense pubescence, close on face, rather close on vertex medially, more sparse laterally, irregular and shallow on shining cheeks; slightly more coarse and deep on thorax, well separated in center of mesonotum and scutellum, close on pleura, but becoming fine and sparse anteriorly; minute on abdomen, close and indistinct toward base, increasingly sparse to the fifth tergum, quite close on the sixth.

Color: Black, antennae deep ferruginous beneath; apices of front and mid tibiae ferruginous; tegulae piceous; wings hyaline, slightly clouded apically, the nervures fuscous; front and middle spurs yellowish, hind spurs more fuscous.

Pubescence: Entirely white on head, thorax and segments 1 and 2 of abdomen, dense on face, clypeus, cheeks below and pleura; discs of third to fifth terga with intermixed dark and light hairs, that on the sixth entirely white, rather sparse; segments 1-5 with broad dense entire white apical fasciae; scopa white, black on sixth sternum.

Holotype female: YUMA, ARIZONA, March 30, 1940 (R. C. Dickson) [Timberlake]. *Paratype*, 1 ♀, topotypical.

In the paratype a slight amount of variation is to be noted, in that the tegulae and hind spurs are somewhat paler in color, the short pubescence on the discs of the abdominal terga is almost entirely pale, and there is a slight amount of black in the scopa along the hind margin of the fifth sternum.

MEGACHILE (DEROTROPIS) ANOGRAE COCKERELL

CALIFORNIA: 1 ♀, Santa Paula, June 15, 1927. COLORADO: 1 ♀, Mishawauka, July 11, 1937 (H. T. Peters). Also recorded from Inspiration Point, Denver, July 2, 1933. MONTANA: 1 ♀, Jefferson County, July 24, 1924.

MEGACHILE (DEROTROPIS) GRAVITA MITCHELL

CALIFORNIA: 1 ♂, Jamesburg, Hastings Nat. Hist. Reserve, Santa Lucia Mts., Monterey County, 1,900-2,700 feet, May 10, 1938 (Michener). 1 ♀, Cal. Hot Springs, Tulare County, June 2, 1939 (E. C. Van Dyke). 1 ♂, Cuyamaca Lake, July 6, 1929 (R. H. Beamer). OREGON: 1 ♂, Grave Creek, at Reuben Creek, 20 miles north of Grants Pass, June 16, 1937 (Bolinger and Jewett). 1 ♀, Prospect, June 20, 1924 (C. L. Fox).

MEGACHILE (DEROTROPIS) PASCOENSIS MITCHELL

CALIFORNIA: 2 ♂, Coalings, May 14, 1938 (M. Cazier). 1 ♂, 1 ♀, Antioch, May 8 and 11, 1937. 1 ♀, Mt. Diablo, May 12, 1937 (both R. M. and G. E. Bohart). 1 ♀, Briceburg, Mariposa County, June 3, 1938 (R. M. Bohart). 2 ♂, 2 ♀, Jamesburg, Hastings Nat. Hist. Reserve, Santa Lucia Mts., Monterey County, 1,900-2,700 feet, May 21, June 2 and 20, 1938, on *Convolvulus villosus* and *Trifolium* (C. D. Michener). 1 ♀, Cal. Hot Springs, Tulare County, June 2, 1939 (E. C. Van Dyke). 1 ♀, San Luis Obispo, June 17, 1938 (I. McCracken). 1 ♂, Antioch sand dunes, June 4, 1942 (H. A. Scullen). IDAHO: 1 ♂, St. Joe River, July 12, 1927 (M. C. Lane).

MEGACHILE (DEROTROPIS) ALAMOSANA MITCHELL

OREGON: 1 ♂, Boardman, Morrow County, June 4, 1943 (G. R. Ferguson).

KEY TO SPECIES OF DEROTROPIS

FEMALES

1. Scopa entirely black ..... *laurita* Mitch. (and varieties)
– Scopa pale on segments 1-4 2
2. Mesonotum dull, tessellate, with very fine and sparse punctures ..... *xerophila* Ckll.
– Mesonotum more coarsely and closely punctate, the surface between the punctures shining 3
3. Mesonotum and scutellum uniformly densely and rather finely punctate ..... *gravita* Mitch.

– Punctures in center of mesonotum separated at least by a puncture width 4
4. Vertex and scutellum dull, with the punctures fine and very close, no shining spaces evident ..... *pascoensis* Mitch.
– Vertex and scutellum more shining, with definite spaces evident between the punctures 5
5. Scopa on the fifth sternum entirely white, largely dark on the sixth; distance from middle tooth of mandible to the inner tooth not quite twice that from the middle tooth to the apex ..... *yumensis* Mitch.
– Scopa entirely black on fifth and sixth sterna 6
6. Pubescence of discs of segments 1-4 of abdomen entirely or largely pale, with very inconspicuous darker hairs or none; the sixth with erect black hairs and subappressed inconspicuous silvery tomentum ..... *subanograe* Mitch.
– Third and usually the second terga with conspicuous black pubescence 7
7. Sixth tergum with erect black hairs, otherwise bare, with no evidence of pale tomentum; distance from middle to inner teeth of mandible fully three times that from middle tooth to apex ..... *anograe* Ckll.
– Sixth tergum with at least some silvery tomentum; distance from middle to inner teeth of mandible not so extreme 8
8. Sixth tergum uniformly covered with fine suberect silvery pubescence, with no dark hairs in evidence, the punctures uniformly fine and close even at base; hind metatarsi very narrow, hardly more than half as wide as their tibiae ..... *astragali* Mitch.
– Sixth tergum with conspicuous erect black hairs; hind metatarsi nearly equal to their tibiae in width ..... *melanderi* Mitch.

MALES

1. Front tarsi black, entirely simple, neither dilated nor excavated ..... *astragali*
– Front tarsi yellowish or ferruginous, dilated and excavated 2
2. Mesosternum with a pair of acute tubercles anterior to the mid coxae ..... *gravita*
– Mesosternum not spinose 3
3. Mesonotum dull and tessellate, almost impunctate medially; seventh tergum simple ..... *xerophila*
– Mesonotum more shining, distinctly punctate medially; seventh tergum wits a slender apical spine 4
4. Fifth tergum polished, the punctures sparse and minute, its apical margin not fasciate ..... *alamosana*
– Fifth tergum more closely and coarsely punctate, and with a distinct white apical fascia 5
5. Apical margin of clypeus with a broad and deep median emargination ..... *pascoensis*
– Apical margin of clypeus entire ..... *maurata* (*subanograe?*)

STUDIES AMONG THE COCCINELLIDAE—No. 9
(Coleoptera)

BY F. W. NUNENMACHER
Piedmont, California

Zenora tricolor Nunenmacher, new species

Light yellow, black and brick red. Head and pronotum yellow, with the exception of a faint trace of black in front of the scutellum where the black of the elytra overlaps. The simplest way to describe the elytra is to say they are black with yellow margins and a brick red disc on the suture at about the center. The size of this disc is from about one-fourth the elytral length to beyond the middle, and from not quite the center of each elytron. Unequal coarse punctures. The little remaining pubescence is white. Ventral surface, mouth parts, antennae, legs, sides and segments yellow, breast a little darker. Length 3 mm., width 2.25 mm.

Holotype female, in the author's collection, from PARA AMAZON, no other data.

Crotch, Revision of the Coccinellidae, pp. 277-278, gives the following description: *Z. revistita* Muls. Var. E. Elytra metallic green, the margins from the shoulder to the apex pale ochrous but the disc pale. I do not think my species belongs to this group.

Th. Dobzhansky, in Beetles of the Genus *Hyperaspis* Inhabiting the United States, 1941, says he cannot place the following three of my species: *falli, floribunda* and *walcotti.* I would like to make this clear to the students: *falli* is a true *Hyperaspis*; *floribunda* and *walcotti* belong in *Hyperaspidius.* And to clear the note part of his statement, at that time I did not think that the genus *Hyperaspidius* would stand. The genus is principally based on the fova or depression of the epipleura which receives the knees of the hind pair of legs. I was then working on a lot of South American species of *Hyperaspis* and had noted that in many cases this fova is very shallow, and must be viewed in a very good, clear light to be seen. I still think it is a weak genus.

The following three species of *Hyperaspidius* are undescribed, and I take this opportunity to make them known.

Hyperaspidius juniperus Nunenmacher, new species

Head straw yellow. Pronotum rufescent, margins and angles lighter. Elytra about as long as wide with tip slightly truncate, with a median and a common sutural black vitta. The median vitta somewhat broader than the light space at either side, starting at the callus and running parallel to the margin about five-sixths the length where it curves, becoming a narrow line which joins the sutural vitta. The sutural vitta at base a little wider than the scutellum, gradually widening, broadest at about one-third the length, then narrowing to about two-thirds, from here remaining about the same width as at base to the tip of the elytra. Very finely punctured. Ventral surface and legs rufescent. Length 2 mm., width 1.25 mm.

Holotype male, in collection of author, from TEHACHAPI PASS, KERN COUNTY, CALIFORNIA, June 8, 1940, on *Juniperus californicus*. Collected by R. G. Dahl who very kindly gave it to me.

Hyperaspidius rossi Nunenmacher, new species

Black and yellow. Head and pronotum deep shiny black, very finely punctured. Elytra longer than wide, tip slightly truncate; with a narrow yellow marginal band starting at the side of the scutellum to about the middle where it is interrupted for a short space, then it starts again just around the humeral angle along the margin not quite to two-thirds the length where it is a little broader; also a small spot at the tip, the same distance from the sutural margin and the tip of the elytron*, and a small elongate spot at two-thirds, about its own width from the suture and about twice as long as wide. Finely punctured, a little stronger than on pronotum. Ventral surface and legs black, anterior tibiae and tarsi pitchy. Length 2 mm., width 1.25 mm.

Holotype female, in collection of author, from OREGON, July, 1938, with no other data. This pretty little specimen was kindly given to me by Dr. E. S. Ross some years ago.

Hyperaspidius shauli Nunenmacher, new species

Yellow and black. Head and pronotum rufescent, margins and angles lighter; females slightly darker than males. Elytra about as long as wide, tip not truncate. With a median and a common sutural black vitta. The median vitta starts at the callus and runs parallel to the margin to about five-sixths, where it curves and becomes a narrow line joining the sutural vitta. In the male this vitta is only about half as broad as in the female. The sutural

*I think a series of specimens will show this band and also the spot at the tip united to form a solid vitta.

vitta starts at the base, just covering the scutellum, and is the same width to the tip. Very finely punctured. Ventral surface rufescent, the epipleura yellow. Length 2 mm., width 1.25 mm.

Holotype male, *allotype* female and four *paratypes*, all from PERRYTON, TEXAS, August 13, 1937, collected by R. E. Shaul. Types and two paratypes in the author's collection, one paratype female in J. E. Blum's collection.

This species is narrower, lighter in color, and the vitta are narrower than in *oblongus* Casey, as I remember his type.

Coccinella ampla var. **rufa** Nunenmacher, new variety

Coccinella ampla seems to be very variable even among those with complete maculations to albino forms. In July, 1937, A. R. Mead collected Coccinellidae in Mexico for me. Among his material I find seven specimens of this species collected in Oaxaca, Mexico, that are rufescent. The color and pattern of the pronotum is fairly constant, with the exception of a yellow border, which in one or two specimens has a pale reddish color. The elytra are rufescent with a narrow pale margin. In the darkest colored specimens there is a trace of the black markings of the type form. This variety may take the name *rufa* Nunemacher, n. var.

Types and five paratypes remain in the author's collection.

AN ABERRANT SPECIMEN OF AGLAIS ANTIOPA (LINN.)

On September 3, 1944, while collecting in the open forestland near the Donner Summit Inn, at an altitude of approximately 7,000 feet an aberrant specimen of *Aglais antiopa* was seen. The specimen was observed closely, although it subsequently evaded capture and disappeared. It was undoubtedly of the type which has been named *hygiaea* Heydenr., as all other named aberrations of this species vary in other respects than the great widening of the yellow border and loss of the submarginal band of purple spots. In this specimen the yellow border was greatly broadened and diffused inwardly, occupying at least one-third of the width of the wing. In this respect it equalled, or perhaps even surpassed the width in the specimen figured by J. A. Comstock in Butterflies of California, Plate 42, figs. 3 and 5. Only a slight darkening apparently remained of the submarginal band of spots.—R. W. L. POTTS and R. F. SMITH.

NEW SPECIES OF NORTH AMERICAN OSTOMIDAE
(Coleoptera)

BY EDWIN C. VAN DYKE
California Academy of Sciences, San Francisco

In 1915, I published in the Bulletin of the Brooklyn Entomological Society, descriptions of a number of new species of the genera *Nemozoma* and *Corticotomus* and gave a short review of the known species found north of Mexico. In 1916, in the same journal, I described another *Nemozoma*, the name of which had to be modified later because it was found to have been previously used in the same genus. In 1918, in the Journal of the New York Entomological Society, Schaeffer contributed an article in which he described new species in both *Nemozoma* and *Corticotomus* while in 1916, Casey described in his Memoirs, a closely related genus and made certain remarks concerning *Corticotomus*. Recently, other undescribed species of both *Nemozoma* and *Corticotomus* as well as a related species which will have to have a new genus erected for it, have come into my hands. These recent additions I will now describe and inasmuch as there is still considerable confusion concerning previously described species and some new information, make revised synopses of the two genera.

Nemozoma cupressi Van Dyke, new species

Elongate, about five times as long as broad, cylindrical, moderately shining, black with a rufous patch covering a little more than a fourth of the base of the elytra yet not reaching the lateral margins, and the three segments of the antennal club also somewhat rufous. Head about one-eighth longer than broad, deeply sulcate anteriorly and with an acute angular emargination in front with the apices of its lateral boundaries slightly everted, with distinct and well spaced punctures and a linear groove at the bottom of the sulcus and at the base of the head in line with it; antennae 11—segmented, reaching the base of head, segments 2-8 small, 3-8 gradually broader and as a whole subequal in length to the club the first two segments of which are almost three times as broad as the eighth segment; eyes moderately large but much flattened as seen from above as they hardly project beyond the side margin of the head. Prothorax equal to the head in length, narrower at base than elytra, gradually broader toward apex where about equal in breadth to head and elytra, disk convex, with punc-

tures similar to those of head, side and basal margin fine. Elytra about twice as long as broad, sparsely, finely and irregularly punctured except near base and suture where arranged in rows, the general surface also less shining than head and pronotum, and the apex with the sutural striae well impressed. Beneath rather finely and sparsely punctured on head and entire thorax and still more finely punctured on abodmen. Length, 6.5 mm.; breadth, 2 mm.

Holotype (No. 5426, Mus. Calif. Acad. Sci., Ent.) and one *paratype*, the latter 7.5 mm. in length, both beaten from Sargent cypress at OCCIDENTAL, SONOMA COUNTY, CALIFORNIA, August 1, 1939, by Arthur T. McClay. The paratype is in the collection of Mr. McClay.

This species is in general a bit larger than *N. fissiceps* (Fall), our largest species hitherto described and somewhat similar except that the latter has the pronotum an orange red and the legs as well as base of elytra reddish, and elytral punctures more regularly arranged. *N. attenuatum* Van Dyke is smaller and much narrower, more attenuated, has somewhat rufous legs as well as 10 segmented antennae; *N. punctulata* Van Dyke is similarly colored, smaller, has the orange patch at base of elytra more extensive and the elytral punctures more regular; while *N. schwarzi* Schaeffer is very much smaller, has shorter elytra and orange patches near apices of elytra as well as near the base.

Nemozoma fenyesi Van Dyke, new species

Elongate, not quite five times as long as broad, cylindrical, moderately shining, head, pronotum and narrow basal area of elytra black, the greater portion of elytra a bright red, and the antennal club, legs and entire under surface more or less rufous. Head almost as broad as long, deeply sulcate anteriorly as usual but with the frontal margin feebly trisinuate, almost transverse, the median portion narrowly and feebly emarginate, not deeply and angularly cleft as in our Pacific Coast species, with distinct and well spaced punctures and the median linear groove not apparent in the sulcus nor at the base of the head; the antennae 11—segmented, reaching the base of the head, with segments 2-8 small, as a whole subsqual in length to the club, the club three-segmented as usual and very distinctly unilaterally dilated; the eyes moderately large but flattened as in the preceding species. Prothorax equal to the head in length, just perceptibly narrower at base, the sides straight and parallel, disk convex, with punctures similar to those of head but finer and denser, side and basal margins fine but distinct. Elytra more than two and a half times as long as broad, striate, the sutural stria well impressed and complete, the discal distinct but the lateral lacking, the strial punctures fine and close together

medially, less regular laterally. Beneath rather finely and sparsely punctured. Length, 7 mm.; breadth, 1.75 mm.

Holotype (No. 5427, Mus. Calif. Acad. Sci., Ent.), a unique from the Fenyes' collection of the California Academy of Sciences, collected by Dr. Fenyes at CORDOBA, MEXICO.

This species is very distinct from any of our species, by its color pattern and physical characters, particularly the modifications at the front of the head, and the distinct elytral striation, and from the Guatemalan species, *signatum* Sharp. by the color pattern. Dr. Sharp did not clearly describe the peculiarities of the head in his species but from the illustration given in the "Biologia," I am inclined to believe that *fenyesi* and *signatum* have the front of the head quite similar.

SYNOPTIC TABLE FOR THE SEPARATION OF THE AMERICAN SPECIES OF NEMOZOMA, FOUND NORTH OF MEXICO.

1. Antennae with 10 segments.....*Nemozoma* Latr.
   Very narrow and about six times as long as broad, head broader than prothorax or elytra, black with basal third of elytra orange. Carmel, California, on Monterey pine, Cannon Beach, Ore., on Sitka spruce. 4-4.5 mm.....*attenuatum* Van Dyke
– Antennae with 11 segments.....Subgenus *Monesoma* Lév. 2
2. Pronotum, base of elytra, antennae and legs orange or rufous, the remainder black, from 3-4 times as long as broad. Sierra Nevada Mts. of California and normally on *Libocedrus*, a stray on other conifers. 5-6 mm.....*fissiceps* Fall
– Head and pronotum similarly colored.....3
3. Head and pronotum piceous or somewhat rufous, an orange patch at the base of elytra and another near apex of each elytron, elytra shorter than abdomen, head narrowly grooved in front, not broadly sulcate. Arizona and Yuma, California. 3.5 mm.....*schwarzi* Schaef.
– Head and pronotum black, base of elytra only orange or reddish 4
4. Larger species, head broadly sulcate in front, rufous patch at base of elytra and not reaching side margins, legs piceous or unicolorous with body beneath, elytral punctures quite irregular. Occidental, Sonoma County, California, on Sargent's cypress. 6.5-7.5 mm.....*cupressi* Van Dyke
– Smaller species, head narrowly sulcate in front, orange patch at base of elytra fully one-third length of elytra and generally reaching side margin, legs somewhat rufous, elytral punctures more or less regularly arranged in rows. Br. Col., Or. and northeastern California, on pines. 4.5-5.5 mm.....*punctulata* Van Dyke

As indicated in the table, *attenuatum* is the only species in our fauna which agrees with the European *elongatum* L., the type of the genus *Nemozoma* of Latreille, in having ten-segmented antennae. Its geographical position is also significant in this connection for it is strictly a member of the Vancouveran insect fauna, the fauna which has in many ways a close relationship to the Eurasian fauna. All our other species have eleven-segmented antennae and hence fall into *Monesoma* of Léveillé which is generally considered, and I think correctly so, to be but a subgenus of *Nemozoma*. The bulk of the species in the subgenus are confined to the New World: western North America, Mexico, Central and South America. Our Pacific Coast species are somewhat similar in having the head very deeply sulcate in front and angularly divergent apically, also with a somewhat similar color pattern. Our Arizona species, *schwarzi*, is somewhat different in that it has the head narrowly grooved in front, the elytra short and quadrimaculate. The Mexican species, *fenyesi*, which I have described above, differs from all the species found north of it in not having the apex of the head distinctly and triangularly notched but by being almost transverse. The Guatemalan species, *signatum*, I believe also approaches it in this regard.

Genus Corticotomus Sharp

The members of this genus superficially resemble those of *Nemozoma* and have quite similar habits, also often have similar color patterns. They differ by having the head flattened above or even somewhat concave, with the mandibles directed upward, not downward as in *Nemozoma*, and as discovered by Casey, have the elytra with a perforate foramen within the humeri. It is entirely a New World genus, found in both North and South America. In the Leng Catalogue, the species are correctly placed but in the Coleopterorum Catalogus, they are placed partly in *Nemozoma* and partly in *Corticotomus*. The genus *Parafilumis* Casey with the single species, *estriata* Casey, is very closely related to *Corticotomus* and apparently only differing from *californicus* Van Dyke by having the elytra diffusely punctured, not with the punctures more or less regularly arranged in rows. Three of the species of *Corticotomus* are found on the Pacific Coast, three on the Atlantic Coast, with one subspecies in southern Texas. *Parafilumis* is from Oregon.

Corticotomus apicalis Van Dyke, new species

Small, elongate, about four times as long as broad, moderately convex above, more or less flattened as seen from the side, shining black, with antennae, palpi, legs and disk of elytra anteriorly testaceous. Head almost as broad as long, depressed in front and with a feeble yet distinct triangular excavation, apical margin transverse, mandibles prominent and feebly upturned, punctures well impressed and dense in frontal impression, more sparse at base and somewhat aciculate at sides; antennae 11-segmented, reaching several segments behind base of head, segments 2-8 small, gradually broader outwardly, club well developed, distinctly unilaterally dilated, segments 9-10 triangular and eleventh elliptical; eyes of fair size and feebly convex and projecting from the side of head as seen from above. Prothorax somewhat longer than head, rounded at base and with sides straight and parallel, side and basal margins fine but distinct, punctures rather evenly placed and well spaced. Elytra testaceous over three-fourths of area anteriorly and piceous at apex, the dark area extending forward along suture and sides, about one-fourth longer than head and prothorax together, at least twice as long as broad, feebly striate at sides of disk, more obscurely so toward suture and side margin, punctures fine and close in striae, more vague where striae poorly defined, intervals flat and with a series of fine punctures, generally close to the strial punctures giving at times the appearance of double striation, and a perforate foramen within the humeri. Beneath finely, sparsely punctured in front, abdomen quite smooth. Length, 3.5 mm.; breadth, 1 mm.

Holotype (No. 5428, Mus. Calif. Acad. Sci., Ent.), from MT. WILSON, CALIFORNIA, August 5, 1924, in the Blaisdell collection of the California Academy of Sciences, and two *paratypes*; ANDERSON'S VALLEY, CALIFORNIA, March 12, 1914, from Sugar pine and MT. ST. HELENA, CALIFORNIA, March 29, 1931, collected by myself from the burrows of *Cryphalus* in Douglas fir. The paratypes have the elytral striae less marked than they are in the type.

The specimens mentioned above, I have had set aside for sometime, considering that they perhaps belonged to a pygmy race of *caviceps*. Upon more critically reexamining them, however, I find characters which set them aside from that species. It is not only smaller, but proportionately narrower, more shining, the prothorax longer than broad, about as broad as long in *caviceps*, and with finer and less dense punctuation. The elytra have a different color pattern and are less convex, in fact the entire insect is more depressed, with a dorsoventral measurement much less than in the other.

Synoptic Table for the Separation of the Species of Corticotomus Found North of Mexico

1. Species bicolored or piceous.....2
– Species uniformly castaneous or testaceous, not over 4 mm. in length 6
2. The prothorax as broad as long.....3
3. Larger species, averaging 5 mm. in length, cylindrical, prothorax rather densely punctured with punctures spaced their own breadth apart, piceous with rufous antennae and legs and a rufous patch extending obliquely inward and backward from base of elytra. Rocky Mountains west to Cascades and Sierra Nevada Mountains. On pines.....*caviceps* (Fall)
– Smaller species, 4.5 mm. in length, depressed or somewhat flattened, prothorax densely, closely punctured, elytra distinctly striato-punctate, the serial punctures of intervals also quite evident, piceous with rufous antennae and legs, also sometimes head, and a rufous area along the sides of the elytra. New Jersey and adjacent Atlantic States. On pine..*depressus* Schaef.
4. Distinctly cylindrical with head and pronotum densely, closely punctured, the strial punctures of elytra quite evident at least in front 5
– Somewhat depressed or flattened, head and pronotum black, shining and with punctures as a rule spaced their own width apart, elytra testaceous over basal two-thirds, apex piceous. Calif. on Douglas fir and Sugar pine. 3.5 mm...*apicalis* new spec.
5. Head, prothorax, antennae and legs rufous, basal third or more of elytra orange, apical area black. Atlantic States especially the South, on pines. 3-4 mm.....*cylindricus* (Lec.)
– Entire insect above piceous or more or less rufous if somewhat immature. 3-4 mm.....*cylindricus texanus* Schaef.
6. Castaneous or rufous above, legs lighter, head and pronotum finely, sparsely punctured, elytra evidently striato-punctate in front, obsoletely so behind. Penn. and other Atlantic States. 3.25 mm.....*parallelus* (Melsh.)
– Castaneous or testaceous, punctures of head and prothorax numerous but spaced their own width apart, elytra with vague strial and minute, serially arranged punctures over greater part of disk. Northern Calif. on Ponderosa pine. 3-3.5 mm. .....*californicus* Van Dyke

Pseudocotomus Van Dyke, new genus

Similar to *Corticotomus* Sharp in most particulars such as the elongated and cylindrical form, 11-segmented antennae with enlarged, loose, three-segmented club, slightly upturned mandibles, serial arrangement of elytral punctures, and short legs but differing in the following regards: very small size, head convex above, not flattened or concave, the submentum not distinctly sep-

arable from the gular in front, trisinuate anteriorly and with the outer angles extending forward as a tooth or prominent angular process beneath and beyond the base of the antennae and partly overlapping the base of the mandibles, the elytra convex, very markedly alutaceous, without the perforate foramen within the humeri first observed by Casey as so evident in *Corticotomus*, and the serial punctures very distinctly but very shallowly impressed.

Genotype: *Pseudocotomus mclayi* Van Dyke.

Pseudocotomus mclayi Van Dyke, new species

Very small, linear and cylindrical, testaceous, legs and antennae lighter in color, moderately shining, the micro-reticulation very evident with good magnification. Head as wide as the prothorax anteriorly and somewhat shorter, with sides parallel behind the eyes, convex above, clypeus with a feeble emargination at center, with deep and well spaced punctures dorsally and laterally; antennae about reaching the base of head, with segments 3-8 small and hardly broader outwardly, together about equal in length to the club which is three-segmented, prominent and bilaterally dilated; eyes moderate in size, granular, and slightly projecting outward from the sides of the head as seen from above. Prothorax about one and a half times as long as wide, rounded at base, with sides straight and feebly diverging to apex where thorax slightly broader than elytra, the apical margin arcuate, disk finely, sparsely punctured with a few minute setae laterally, lateral and basal margins fine. Elytra about two and a half times as long as broad, with sides straight and parallel, apex rounded, disk with sutural striae faintly defined toward apex otherwise without striae but with punctures serially arranged, well spaced, shallowly impressed yet quite evident against the alutaceous background. Beneath slightly darker on after-body and with a few distinct punctures especially at sides of metathorax and with a scattering of setae. Length, 2 mm.; breadth, about .75 mm.

Holotype (No. 5429, Mus. Calif. Acad. Sci., Ent.) and eleven paratypes, all reared from the burrows of a Scolytid, *Pseudothysanous bartoni* Bruck, in *Malvastrom*, from WESTWOOD HILLS, LOS ANGELES COUNTY, CALIFORNIA, by Arthur T. McClay. The specimens emerged on various dates as October 22, 1936, May 1, 1937 (Holotype) and June, 1937. Half of the specimens are now in the McClay collection and half in the collection of the California Academy of Sciences through the kindness of Mr. McClay.

PINTALIA STÅL WITH SPECIAL REFERENCE TO MEXICO
(Homoptera, Cixiidae)

BY JOHN S. CALDWELL
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Specific placement in this genus is very difficult because the older descriptions were based on color and marking which is somewhat confusing in this group. Stål[1] described nine species from Brazil, Lethierry[2] one from Venzuela, Uhler[3] two from the West Indies and Fabricius[4] one, Fowler[5] four from Mexico and one from Guatemala, Van Duzee[6] one from the United States, Muir[7] twenty-seven species and one variety from Brazil, British Guiana, and Ecuador, Osborn[8] four from Puerto Rico, and Metcalf[9] two from Panama. Muir has stated that *consobrina* and *ustulata* Stål are not typical tentatively leaving forty-nine species with *discrepans* provisionally included in *Pintalia*. Undoubtedly intensive collecting will more than double the number of known species. Unless stated otherwise all types are in the author's collection.

Pintalia dorsovittata Van Duzee (figs. 1, 1a)

If I interpret this species correctly it has been confused with *delicata* Fowler. In a series of twenty specimens from Florida, South Carolina, Tennessee, and Virginia the elytra are not always unicolorous with the distinct dorsal stripe. The intensity of color has a wide range and most of the specimens have a more or less mottled elytra. *Aspersa* Dozier[10] from Mississippi either belongs to this species or is new.

Pintalia delicata Fowler (figs. 2, 2a)

Delicata is widely distributed throughout Mexico and it is

[1] 1862. Bidr. Rio Janeiro-trakt. Hemip., 2:4-5.
[2] 1890. Ann. Soc. Ent. France, (6)10:148.
[3] 1895. Proc. Zool. Soc. London, pp. 64, and 1901. Proc. Ent. Soc. Washington, 4:511.
[4] 1803. Systema Rhyng., p. 54.
[5] 1904. Biologia Centrali-Americana, 1:86-88.
[6] 1908. Proc. Acad. Nat. Sci. Philadelphia, p. 491.
[7] 1934. Trans. Royal Ent. Soc. London, 82:421-441.
[8] 1935. New York Acad. Sci., (2)14:198-202.
[9] 1938. Bull. Mus. Comp. Zool., Harvard College, 82:290-293.
[10] 1926. Mississippi Agric. Exp. Sta. Tech. Bull., 14:68-69.

possible that it occurs in the United States. Specimens are present from the States of Chiapas, Guerrero, Jalisco, Michoacan, Morelos, Oxaca, Quintana Roo, Sinola, Sinora, and Vera Cruz in Mexico, and from Guatemala. The male genitalia will serve to separate this from any known species. The anal segment is long and slightly asymmetrical caudad. The lateral margins of the pygofers are acutely produced dorsad; the medio-ventral process is long and rounded apically. The aedeagus does not have many processes. Fowler's description of the styles is perfect.

Pintalia lineata Caldwell, new species (figs. 3, 3a)

Length, 5.8-6 mm. Vertex, pronotum, and mesonotum with mid-dorsal yellow stripe that is carried onto the elytra to the apex of the clavus. Elytra transparent, browned basad and caudad with smoky areas in between; terminations of veins light.

Anal segment of male with short apex. Lateral margins of pygofers with small projection dorsad; medio-ventral process large, rounded apically. Styles widely separated in basal half, meeting at mid-length then strongly divergent.

Holotype male, VERGEL, CHIAPAS, MEXICO, June 3, 1935; *paratype*, MAPASTEPEC, CHIAPAS, MEXICO, December 7, 1932 (Dampf).

Pintalia marginata Caldwell, new species (figs. 4, 4a)

Length, male 8 mm., female 9 mm. Elytra transparent, maculate with fuscous; maculae tending to be concentrated around wing margins; apical margin fumate. Veins punctate. Hind wings evenly smoked.

Lateral margins of male pygofers with blunt projection caudad; medio-ventral process acute, triangular. Styles widely separated basad forming a diamond-shaped space; apical three-fourths divergent.

Holotype male, and one *paratype* from TIERRA BLANCA, VERA CRUZ, MEXICO, August 20, 1932, *allotype* female, HUATUSCO, VERA CRUZ, MEXICO, September, 1932 (Dampf).

Pintalia stigmata Caldwell, new species (figs. 5, 5a)

Length, 6.8 mm. Head, body and legs yellow-brown. Elytra hyaline, grayish, slightly fumed apically; stigmal spot brown; cross-veins smoky. Frons almost twice as long as broad, scarcely narrowed between the eyes. Hind tibiae with one prominent spine

at mid-length and two smaller spines more basad. Veins of elytra finely but distinctly granulate.

Anal segment of male long, slender, extreme apex with square, shallow notch. Lateral margins of pygofers with large projection basad; medio-ventral process small, acute. Styles slender, lunate, approximate apically, very pubescent.

Holotype male, from BARTICA, BRITISH GUIANA, June 12, 1901 (H. S. Parish), is in the H. Osborn collection at Columbus, Ohio.

Pintalia fumata Caldwell, new species (figs. 6, 6a)

Length, 8.5 mm. Head and thorax amber with lateral compartments of mesonotum darker. Elytra whitish, hyaline; fuscous spot present either side of brown stigma and at apex of clavus; basal and claval areas lightly fumate; indistinct fuscous maculae present basad; extreme apex of elytra fuscous. Hind tibiae quadrispinose.

Anal segment of male asymmetrical at apex; right side not produced as much as left. Lateral margins of pygofers greatly produced caudad. Styles broadest just before base, finely serrate basad on inner margins.

Holotype, male, "COSTA RICO, SUIZATUR'LBA, (P. Schild)" is in the H. Osborn collection at Columbus. Ohio.

Pintalia punctata Caldwell, new species (figs. 7, 7a)

Length, 6.7-8 mm. Head and thorax ferruginous. Elytra transparent, dusty; costal margin dark from stigmal spot to apex; entire apex broadly smoky; granulations on veins broadly fuscous; entire surface very evenly maculate. Entire insect slender.

Anal segment of male extremely asymmetrical with apex broadly bilobed on right side. Lateral margins of pygofers with two processes caudad; medio-ventral process very acute. Styles slightly enlarged apically, straight in ventral aspect.

Holotype male, and *allotype*, female, from ZOOGOCHI, OAXACA, MEXICO, June 21, 1935, two male paratypes and one female *paratype* from CHILTEPEC, OAXACA, MEXICO, December 10, 1937, (Dampf). This species should truly be named maculata but the name has already been used by both Fowler and Osborn. For *maculata* Osborn I propose the name *osborni*.

Pintalia pseudomaculata Caldwell, new species (figs. 8, 8a)

Length, 7.5 mm. Head and thorax dark brown. Elytra marking similar to *punctata* except that the stigmal spot is brown and

the maculae along the veins tend to run together. The elytra are much broader, especially apically.

Anal segment of male elongate, extremely asymmetrical apically with the right side forming a broad pendulant lobe. Lateral margins of pygofers with two large projections caudad; medio-ventral process broad, triangular. Styles gradually enlarged apically, divergent in caudal half.

Holotype male, from TAMAZUNCHALE, SAN LUIS POTOSI, MEXICO, November 15, 1938, (Caldwell).

Pintalia chromata Caldwell, new species (figs. 10, 10a)

Length, 7-7.5 mm. Head and pronotum yellow. Mesonotum darker yellow. Elytra clear, yellowish, especially apically. Veins sparingly punctate with black; a black spot present at union of claval veins and at apex of clavus. Anal segment of male asymmetrical at apex with a short and an elongate lobe on right side. Lateral margins of pygofers with two hooked projections caudad; medio-ventral projection acute. Styles gradually enlarged apically.

Holotype male, *allotype* female, and *paratypes* from FORTIN, VERA CRUZ, MEXICO, October 9, 1941 (De Long, Good, Caldwell and Plummer).

Pintalia geometra Caldwell, new species (figs. 9, 9a)

Length, 7.5-8.5 mm. Face black. Vertex and center of pronotum brown. Center of mesonotum brown, lateral compartments black. Elytra fuscous, hyaline, with the following markings clear to white: a spot basad reaching into claval area but not to sutural margin, sutural margin yellowish punctate with white, a triangle with base touching union of claval veins and apex of clavus and the apex reaching to the radius, the stigmal spot and surrounding area, the submarginal area sometimes broken, and the extreme apex sometimes clear.

Anal segment of male short asymmetrical, right side broadly pendulant. Pygofers with short caudal projection; medio-ventral process short, rounded. Styles slender.

Holotype male, and two *paratypes* from VERGEL, CHIAPAS, MEXICO, June 3, 1935, and female allotype from ESMERALDA, CHIAPAS, MEXICO, August 18, 1930 (Dampf).

Pintalia contra Caldwell, new species (figs. 11, 11a)

Length, 6 mm. Head and thorax dull orange. Elytra fuscous with light area in humeral angle, a large spot present in costal

cell, and a broad stripe across the entire surface cephalad to stigmal spot. Underwing solid fuscous. Hind tibiae with one strong spine.

Anal segment of male with right side of apex cut away. Lateral margins of pygofers with small caudal projection; medio-ventral process large, triangular. Styles strongly divergent in apical half.

Holotype male, and *paratype* male, from COROICO, BOLIVIA, are in the H. Osborn collection at Columbus, Ohio. Paratype in writer's collection.

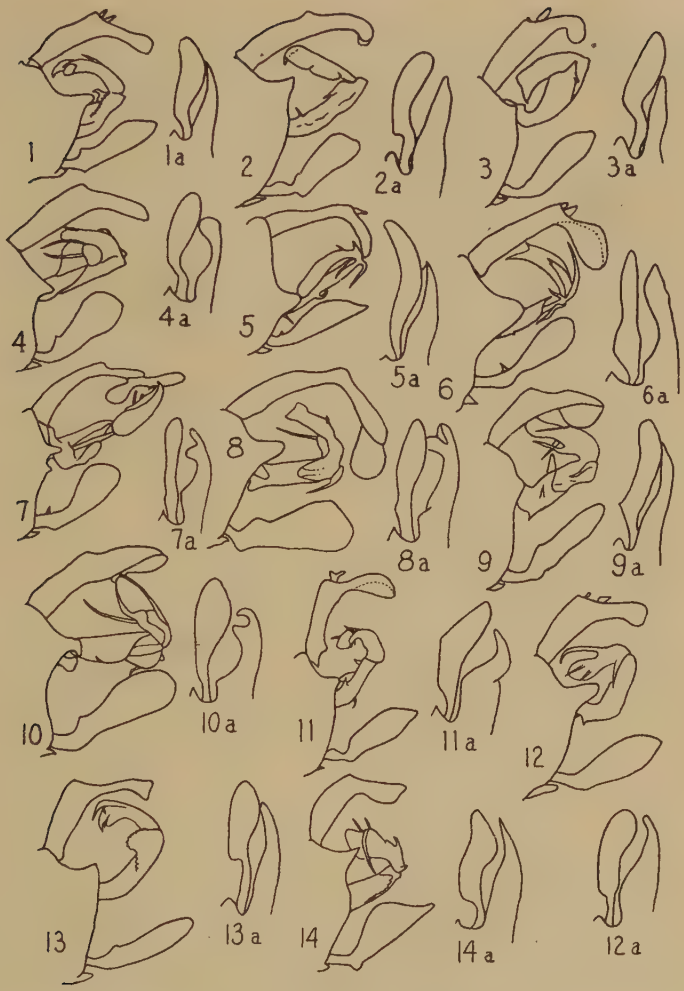
PINTALIA ASPERSA FOWLER
(Figs. 12, 12a)

This is a short and compact species with the lateral carinae of the frons wide and flattened. This latter character is similar to *discrepans* Muir which Muir only provisionally places in this genus. Likewise Fowler believed that *aspersa* may not belong in *Pintalia*. However, from the species and specimens before me this character appears to be gradational with several species exhibiting carinae with varying degrees of flatness making it impossible to draw any definite line between the two groups. Most of the specimens with flattened carinae have the radius usually four-branched but this is not consistent. Most of the specimens before me are darker than the illustrations in the Biologia (pl. 9, fig. 24) with the mid-dorsal stripe less pronounced. The size ranges between 5 and 6.4 mm. with several females as well as males only 5 mm. The most spines visible on the hind tibiae are four with three being more common. The lateral margins of the male pygofers have a rather long, acute projection caudad and well dorsad; medio-ventral process is very small. Specimens from Oaxaca, San Luis Potosi, and Vera Cruz in Mexico, and two from Guatemala.

Pintalia neoaspersa Caldwell, new species (figs. 13, 13a)

Length, 6-6.5 mm. Color and marking identical to *aspersa*, the elytra with possibly more solid colors. Upper third of lateral carinae of frons similar to that species.

Lateral margins of male pygofers truncate, straight; medio-ventral process small, triangular. Styles sharply excavate on inner third of basal margins. Apex of anal segment slender. Aedeagus with coarsely serrated spur on right side of apical portion; periandrium serrate around joint of aedeagus.



Explanation of Figures

Figs. 1, *Pintalia dorsovittata* Van D., lateral view of abdominal apex of male; 1a, same, ventral view of half of abdominal apex of male. Figs. 2, 2a, *P. delicata* Fowler, same views. Figs. 3, 3a, *P. lineata* Caldwell. Figs. 4, 4a, *P. marginata* Caldwell. Figs. 5, 5a, *P. stigmata* Caldwell. Figs. 6, 6a, *P. fumata* Caldwell. Figs. 7, 7a, *P. punctata* Caldwell. Figs. 8, 8a, *P. pseudomaculata* Caldwell. Figs. 9, 9a, *P. geometra* Caldwell. Figs. 10, 10a, *P. chromata* Caldwell. Figs. 11, 11a, *P. contra* Caldwell. Figs. 12, 12a, *P. adspersa* Fowler. Figs. 13, 13a, *P. neoaspersa* Caldwell. Figs. 14, 14a, *P. acarinata* Caldwell.

Holotype male, and *paratype* male, ESMERALDA, CHIAPAS, MEXICO, November 18, 1930, male paratypes SANTA ISABEL, CHIAPAS, MEXICO, November 17, 1930, *allotype* female, and five female paratypes SANTA ISABEL, CHIAPAS, November 17, 1930 (Dampf), and one male *paratype* JESUS CARRANZA, VERA CRUZ, MEXICO, Oct. 14, 1941 (De Long, Good, Caldwell & Plummer).

Pintalia acarinata Caldwell, new species (figs. 14, 14a)

Length, 6 mm. Head and thorax concolorous with lateral compartments of mesonotum darker. Elytra clear to clouded with brown; a definite white spot present at union of claval veins; another extending from apex of clavus almost to apex of elytra; area around stigma clear; a definite fuscous stripe originates at fork of medius and projects toward apex of costal margin, this stripe is sometimes broadened to include the entire apex of the elytra in which case the fuscous is broken by white areas. Apical terminations of veins thickened, white. Carinae of face similar to *aspersa*.

Male styles with inner margins deeply excavate in basal fourth, contiguous in next fourth, divergent in next fourth, and parallel in apical fourth. Anal segment relatively short.

Holotype male, and two paratypes from B. ESPERANZA, GUATEMALA, December 15, 1925 (Dampf).

This species and *neoaspersa* can be separated from *aspersa* by their much more slender appearance, greater length, and distinct male genitalia.

D. B. MACKIE PERPETUAL MEMORIAL LOAN FUND

The California Entomology Club is sponsoring the establishment of a D. B. Mackie Perpetual Memorial Loan Fund for the benefit of graduate students in Entomology at the University of California. The immediate goal is $1,000.00 of which more than $750.00 has already been subscribed. Mr. Mackie's entomological work is an especially suitable memorial for such a fund since he so greatly benefited California Agriculture through his pioneer work in vacuum fumigation, both with cyanide and methyl bromide. Contributions may be sent to H. H. Keifer, Secretary-Treasurer, California Entomology Club, State Office Building No. 1, Sacramento, California.

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